UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807,959	03/23/2004	Mukul R. Prasad	073338.0172 (03-52027 FLA	4100

5073	7590	12/01/2005

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EXAMINER
LAM, NELSON C

ART UNIT	PAPER NUMBER
2825	

DATE MAILED: 12/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>23 March 2004</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-25</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-25</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>23 March 2004</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>03/23/2004</u>.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   Responsive to communication of 03/23/2004. Application 10/807,959 has been

examined. In the examination of 10/807,959, claims 1-25 are pending.

Claim Rejections - 35 USC § 112

2.   The following is a quotation of the **first** paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of
> making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the
> art to which it pertains, or with which it is most nearly connected, to make and use the same and shall
> set forth the best mode contemplated by the inventor of carrying out his invention.

3.   **Claims 1-16 are rejected under 35 U.S.C. 112, first paragraph**, as failing to

comply with the enablement requirement. The claim(s) contains subject matter which

was not described in the specification in such a way as to enable one skilled in the art to

which it pertains, or with which it is most nearly connected, to make and/or use the

invention. In the specification, applicants do not describe or explain a "third engine". For

examination purposes, third engine is interpreted as a method for pre-determining an

order for watched literal selection.

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by
> another filed in the United States before the invention by the applicant for patent or (2) a patent
> granted on an application for patent by another filed in the United States before the invention by the
> applicant for patent, except that an international application filed under the treaty defined in section
> 351(a) shall have the effects for purposes of this subsection of an application filed in the United States
> only if the international application designated the United States and was published under Article 21(2)
> of such treaty in the English language.

5.   **Claims 1-25 are rejected under 35 U.S.C. 102(e)** as being anticipated by Moskewicz et al. (US Patent Application Publication US 2003/0084411).

As per **claim 1**, Moskewicz discloses a system for scheduling events in a Boolean satisfiability (SAT) solver, the system comprising:

a first engine operable to collect one or more first-order statistics on a search for a valid solution to an SAT problem (Abstract; [0009]; [0052]; [0054]);

a second engine operable to derive one or more second-order statistics on the search from the one or more first-order statistics ([0102]; [0110]; [0114]); and

a third engine operable to schedule events in the search according to one or more of the second-order statistics (Fig. 1; [0069]).

As per **claim 2**, Moskewicz discloses the system of claim 1, wherein the events are restarts ([0115]; [0132]).

As per **claim 3**, discloses the system of claim 1, wherein the events are variable reorderings (Fig. 1; [0069]; [0076]; [0079]; [0116]).

As per **claim 4**, Moskewicz discloses the system claim 1, wherein a first one of the first-order statistics indicates a first number of conflicts since a particular event and a second one of the first-order statistics indicates a second number of decisions since the particular event ([0009]; [0014]; [0016]; [0017]; [0052]; [0053]; [0054]).

As per **claim 5**, Moskewicz discloses the system of claim 4, wherein the particular event is a start or a last restart ([0015]; [0016]).

As per **claim 6**, Moskewicz discloses the system of claim 4, wherein the particular event is a variable ordering or a last variable reordering ([0016]; [0076]; [0079]).

As per **claim 7**, Moskewicz discloses the system of claim 1, wherein at least one of the second-order statistics is a conflict-to-decision ratio (CDR) ([0052]; [0053]; [0054]).

As per **claim 8**, Moskewicz discloses the system of claim 1, wherein the search for a valid solution to the SAT problem is associated with electronic design automation (EDA) ([0004]; [0013]; [0015]; [0030]).

As per **claim 9**, Moskewicz discloses a method for scheduling events in a Boolean satisfiability (SAT) solver, the method comprising:

collecting one or more first-order statistics on a search for a valid solution to an SAT problem (Abstract; [0009]; [0052]; [0054]);

deriving one or more second-order statistics on the search from the one or more first-order statistics ([0102]; [0110]; [0114]); and

scheduling events in the search according to one or more of the second-order statistics (Fig. 1; [0069]).

As per **claim 10**, Moskewicz discloses the method of claim 9, wherein the events are restarts ([0115]; [0132]).

As per **claim 11**, Moskewicz discloses the method of claim 9, wherein the events are variable reorderings (Fig. 1; [0069]; [0076]; [0079]; [0116]).

As per **claim 12**, Moskewicz discloses the method of claim 9, wherein a first one of the first-order statistics indicates a first number of conflicts since a particular event and a second one of the first-order statistics indicates a second number of decisions since the particular event ([0009]; [0014]; [0016]; [0017]; [0052]; [0053]; [0054]).

As per **claim 13**, Moskewicz discloses the method of claim 12, wherein the particular event is a start or a last restart ([0015]; [0016]).

As per **claim 14**, Moskewicz discloses the method of claim 12, wherein the particular event is a variable ordering or a last variable reordering ([0016]; [0076]; [0079]).

As per **claim 15**, Moskewicz discloses the method of claim 9, wherein at least one of the second-order statistics is a conflict-to-decision ratio (CDR) ([0052]; [0053]; [0054]).

As per **claim 16**, Moskewicz discloses the method of claim 9, wherein the search for a valid solution to the SAT problem is associated with electronic design automation (EDA) ([0004]; [0013]; [0015]; [0030]).

As per **claim 17**, Moskewicz discloses logic for scheduling events in a Boolean satisfiability (SAT) solver, the logic encoded in media and when executed operable to:

collect one or more first-order statistics on a search for a valid solution to an SAT problem (Abstract; [0009]; [0052]; [0054]);

derive one or more second-order statistics on the search from the one or more first-order statistics ([0102]; [0110]; [0114]); and

schedule events in the search according to one or more of the second-order

statistics (Fig. 1; [0069]).

As per **claim 18**, Moskewicz discloses the logic of claim 17, wherein the events

are restarts ([0115]; [0132]).

As per **claim 19**, Moskewicz discloses the logic of claim 17, wherein the events

are variable reorderings (Fig. 1; [0069]; [0076]; [0079]; [0116]).

As per **claim 20**, Moskewicz discloses the logic of claim 17, wherein a first one of

the first-order statistics indicates a first number of conflicts since a particular event and

a second one of the first-order statistics indicates a second number of decisions since

the particular event ([0009]; [0014]; [0016]; [0017]; [0052]; [0053]; [0054]).

As per **claim 21**, Moskewicz discloses the logic of claim 20, wherein the

particular event is a start or a last restart ([0015]; [0016]).

As per **claim 22**, Moskewicz discloses the logic of claim 20, wherein the

particular event is a variable ordering or a last variable reordering ([0016]; [0076];

[0079]).

As per **claim 23**, Moskewicz discloses the logic of claim 17, wherein at least one

of the second-order statistics is a conflict-to-decision ratio (CDR) ([0052]; [0053];

[0054]).

As per **claim 24**, Moskewicz discloses the logic of claim 17, wherein the search

for a valid solution to the SAT problem is associated with electronic design automation

(EDA) ([0004]; [0013]; [0015]; [0030]).

As per **claim 25**, Moskewicz discloses a system for scheduling events in a

Boolean satisfiability (SAT) solver, the system comprising:

means for collecting one or more first-order statistics on a search for a valid

solution to an SAT problem (Abstract; [0009]; [0052]; [0054]);

means for deriving one or more second-order statistics on the search from the

one or more first-order statistics ([0102]; [0110]; [0114]); and

means for scheduling events in the search according to one or more of the

second-order statistics (Fig. 1; [0069]).

Conclusion

6.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Nelson Lam whose telephone number is 571 272-8318.

The examiner can normally be reached on 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Matthew Smith can be reached on 571 272-1907. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

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For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic
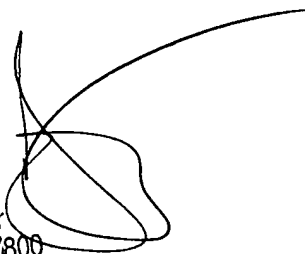
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